



Health and environmental risks associated with emerging pollutants and novel green processes

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With over 100,000 different substances produced and used by industries, chemicals are an integral part of everyday life. The global market of chemicals has an enormous impact on employment and economic growth. However, many substances are discharged in the environment and chemical contamination is now widespread both on land and in water. These environmental pollutants have the potential to induce a large range of acute and long-term effects (e.g., endocrine disruption, immunotoxicity, neurological disorders, cancers...) on human health and ecosystems. To prevent these damages, countries have developed chemical management systems and regulations based on risk assessment processes using a set of standardized assays designed to characterize toxicological and ecotoxicological hazards of chemical. To complete this information and provide a better hazard identification, data from research laboratories, on fate, and effects on human health and environment, is useful.

As demonstrated in this special issue, research laboratories in environmental chemistry, toxicology, and ecotoxicology generate original data and complement regulatory tests. Indeed, these experimental studies investigate novel endpoints such as modulation of prostaglandin biosynthesis by diclofenac (Courant et al.), but also mixture effects as highlighted by Di Poi et al. who measure acute toxicity of pharmaceuticals, personal-care products, and pesticides alone and in combination in aquatic organisms. Fate and effects of environmental pollutants and emerging compounds mobilize a large part of scientific community working in health and environment sciences. However, the efforts in term of knowl-

edge production focus on a limited number of chemicals considered as model compounds or critical chemicals due to environmental occurrence or specific effects. Researchers never investigate a large set of chemicals and only regulatory data required for regulation are available. To bridge this gap, an extensive collaboration between industrial partners developing new chemicals and researchers in toxicology and ecotoxicology appears necessary to quickly produce data related to health and environmental hazard of relevant chemicals.

Partnership between industry and research in toxicology and ecotoxicology could be applied to other questions than adverse effects of chemicals. For example, the health and environmental impact of green technologies and circular economy is as an emerging issue. To address scarcity of fossil fuels, climate change, or biodiversity decline, novel processes based on the circular economy concept are developed involving waste recycling or reuse to produce new products and services. But beyond the concept, there is need to be sure that circular economy and other green processes will not induce health and environment adverse effects. What are the environmental impacts of biorefinery? What could be the adverse effects of recycled plastics used in everyday life on human health? What are the health and environment hazards of green solvents such as ionic liquids? Due to the significant development of green technologies in recent years, these issues deserve much attention. They must mobilize actors of scientific research to complete industrial research activities. Unfortunately, at this stage, few studies address these issues.

To encourage discussion between researchers and stakeholders, the Rovaltain Scientific Foundation organizes the ECOTOX FORUM. During this event, round tables allow to identify needs and challenges associated to major issues on health and environment protection and to initiate partnership to address these challenges. Organized every two years, the next Forum will be held from 11 to 13 October 2018 in Valence (France) as the "Santé, Environnement & Molécules" Forum.

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